CALIFORNIA ENERGY COMMISSION
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NOTIFICATION OF APPROVAL OF STANDARD U-FACTOR DATA FOR WOOD FRAMED ATTIC ROOFS WITH INSULATION ONLY BETWEEN THE CEILING JOISTS

As part of the adoption of the 2013 Building Energy Efficiency Standards, the California Energy Commission adopted the Reference Joint Appendix JA4, which contains standard U-factor, C-factor, and Thermal Mass data for roof, wall, and floor construction assemblies (see page JA4-1 of the Reference Joint Appendices at: http://www.energy.ca.gov/2012publications/CEC-400-2012-005/CEC-400-2012-005-CMF-REV2.pdf#Page=127). The data in Reference Joint Appendix JA4 must be used for all residential and nonresidential compliance approaches, including the mandatory requirements, prescriptive envelope component approaches.

If a construction assembly is not adequately represented in Reference Joint Appendix JA4, an applicant may request approval by the Energy Commission's Executive Director for different data for that construction assembly. The approval of the Executive Director is based on the technical justification submitted by the applicant. Approved standard data for the construction assembly will be published as an addendum to Reference Joint Appendix JA4 for use in all compliance approaches.

This Notice of Approval of Standard U-factor Data for Wood-Framed walls with 5/8 gypsum in Low-Rise Residential Buildings and of Type V Nonresidential Buildings authorizes the use of the data shown in the attached Table 4.3.1(a) with the limitations in the description following the table. Table 4.3.1(a) is officially added as an addendum to Reference Joint Appendix JA4.

Approved by:

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Robert P. Oglesby
Executive Director

Dated_____

JA4.3 Walls

Table 4.3.1(a) – U-factors of Wood Framed Walls with 5/8 gypsum[1]
(Only to be used when 5/8 inch gypsum is installed)

	Cavity Insulation	Nominal Framing Size		Rated R-value of Continuous Insulation [3]						
				R-0	R-2	R-4	R-5	R-6	R-7	R-8
Spacing				A	B	C	D	E	F	G
16 in. OC	None	Any	1	0.343	0.208	0.145	0.126	0.112	0.100	0.091
	R-11	2x4	2	0.109	0.087	0.073	0.067	0.063	0.059	0.055
	R-13	2x4	3	0.101	0.081	0.068	0.063	0.059	0.056	0.052
	R-15 [2]	2x4	4	0.094	0.076	0.064	0.059	0.055	0.052	0.049
	R-19	2x6	5	0.073	0.062	0.054	0.050	0.048	0.045	0.043
	R-21[2]	2x6	6	0.068	0.058	0.050	0.047	0.045	0.041	0.040
	R-22	2x6	7	0.071	0.061	0.053	0.050	0.047	0.044	0.042
	R-19	2x8	8	0.064	0.056	0.050	0.047	0.044	0.042	0.040
	R-22	2x8	9	0.060	0.052	0.046	0.044	0.042	0.040	0.038
	R-25	2x8	10	0.056	0.049	0.043	0.041	0.039	0.037	0.036
	R-30[2]	2x8	11	0.055	0.048	0.043	0.040	0.039	0.037	0.035
24 in. OC	None	Any	12	0.361	0.210	0.147	0.127	0.113	0.101	0.091
	R-11	2x4	13	0.105	0.085	0.071	0.066	0.061	0.058	0.055
	R-13	2x4	14	0.097	0.078	0.066	0.061	0.057	0.054	0.052
	R-15	2x4	22	0.090	0.073	0.062	0.058	0.054	0.051	0.049
	R-19	2x6	15	0.070	0.060	0.052	0.049	0.047	0.044	0.043
	R-21[2]	2x6	16	0.065	0.056	0.049	0.046	0.044	0.041	0.040
	R-22	2x6	17	0.068	0.059	0.051	0.048	0.046	0.043	0.042
	R-19	2x8	18	0.062	0.054	0.048	0.046	0.044	0.042	0.041
	R-22	2x8	19	0.057	0.050	0.045	0.043	0.041	0.039	0.038
	R-25	2x8	20	0.054	0.047	0.042	0.040	0.038	0.036	0.036
	R-30[1]	2x8	21	0.053	0.046	0.041	0.039	0.037	0.036	0.035

Notes

1. The 5/8 inch gypsum board must be verified by the enforcement agency. If 5/8 inch gypsum board is not installed use table 4.3.1.

2. Higher density fiberglass batt is required in these cases.

3. Continuous insulation may be installed on either the inside or the exterior of the wall, or both.

This table contains U-factors for wood framed walls, which are typical of low-rise residential buildings and Type V nonresidential buildings. If continuous insulation is not used, then choices are made from Column A. In this case, the insulation is installed in the cavity between the framing members. When continuous insulation is used, this is typically installed on the exterior side of the wall, but can also be used on the inside. The continuous insulation is typically a rigid polystyrene or polyisocyanurate foam insulation.

When this table is used manually, the R-value of continuous insulation shall be equal to or greater than the R-value published in the continuous insulation columns. No interpolation is permitted when data from the table is used manually. CEC approved compliance software, however, may determine the U-factor for any amount of continuous insulation or for unusual construction assemblies using Equation 4-1 and Equation 4-2.

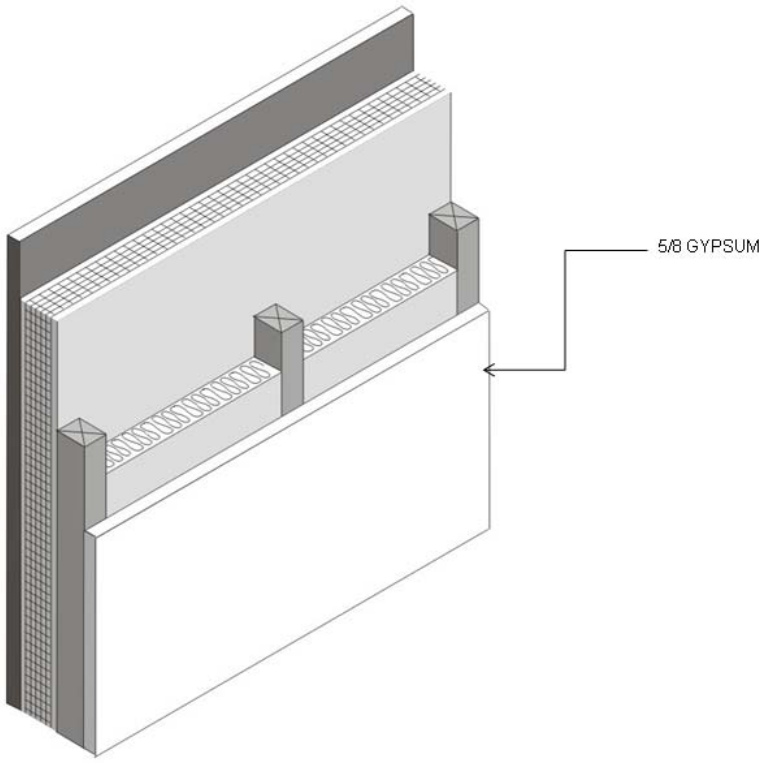

Figure 4.3.1(a) – Wood Framed Wall

Assumptions: Values in this table were calculated using the parallel heat flow calculation method, documented in the 2009 ASHRAE Handbook of Fundamentals. The construction assembly assumes an exterior air film of R-0.17, a 7/8 inch layer of stucco of R-0.18 (SC01), building paper of R-0.06 (BP01), continuous insulation (if any), the cavity insulation / framing layer, 5/8 inch gypsum board of R-0.45 (GP01), and an interior air film 0.68. The framing factor is assumed to be 25 percent for 16 inch stud spacing and 22 percent for 24 inch spacing. Actual cavity depth is 3.5 inch for 2x4, 5.5 inch for 2x6, 7.25 inch for 2x8, 9.25 inch for 2x10, and 11.25 inch for 2x12. High density R-30 insulation is assumed to be 8.5 inch thick batt and R-38 is assumed to be 10.5 inch thick. The thickness of the stucco is assumed to be reduced to 3/8 inch when continuous insulation is applied.